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## THE DISCUSSION ON TUBERCULOSIS

### SECOND PAPER

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(Continued from Vol. II., page 27)

IN a former paper\* an account was given of the sensation in the scientific world which followed Dr. Koch's paper read at the International Congress on Tuberculosis in London in July, 1901. Until then the medical profession, taken as a whole, had for many years held and taught a belief in the unity of bovine and human tuberculosis and its transmission from the animal to the human being through the use of beef, milk, cream, and butter from tuberculous cattle. There were many veterinarians who, headed by the eminent Dr. Bang, of Denmark, discredited this theory, and some physicians—probably more than was supposed—who more or less doubted its truth; but it is safe to say that the doctrine of the identity of tuberculosis in cattle and in man, and its transmission through beef products, had gained a fairly general hold upon the intelligent public and would have steadily strengthened that hold for years to come had it not been for the position taken by Dr. Koch at the Congress of 1901.

It is not the purpose either of my earlier article or of this to support either side of this discussion, but merely to state its present position. When Koch and Bang and Welch and Osler, Salmon and Chapin and Ravenel, hold opposing or neutral opinions, nurses may very well be excused from having firm convictions on either side, but scarcely for being ignorant of the varying phases of the question. Medical principle must always control nursing practice, but "every intelligent person goes on acquiring and modifying opinions, and will while the life worth living lasts."

It should be noticed that Dr. Koch has been very variously quoted—and, it is safe to say, sometimes misquoted. It is hard for one person to state accurately the position or attitude of another, and no better proof of this is needed than the differing opinions which have been attributed to Koch.† What he really said was as follows:

\* "The Discussion on Tuberculosis," *AMERICAN JOURNAL OF NURSING*, October, 1901.

† We find examples of this in nearly every newspaper and magazine which touches on the subject at all, but mention need be made of only one. In the *New York Evening Post*, November, 1901, in an article on "Ethics of Medical Inoculation" we find the following:

“ . . . That from his experiments in infecting healthy cattle with tuberculous material from cattle and from man, he felt justified in maintaining that human tuberculosis differed from bovine and could not be transmitted to cattle. . . . It was well known that the butter and milk consumed in great cities very often contained large quantities of the bacilli of bovine tuberculosis in a living condition, as the numerous infection experiments with such dairy products on animals had proved. Most of the inhabitants of large cities daily consumed such living and perfectly virulent bacilli of bovine tuberculosis, and unintentionally carried out the experiments which we are not at liberty to make. If the bacilli of bovine tuberculosis were able to infect human beings, many cases of tuberculosis caused by the eating of alimenta containing tubercle bacilli could not but occur among the inhabitants of great cities, especially the children. In reality it was not so. That a case of tuberculosis had been caused by alimenta could be assumed with certainty only when the intestine suffered first—*i.e.*, when a so-called primary tuberculosis of the intestine was found. But such cases are extremely rare. Among many cases of tuberculosis examined after death, he himself remembered having seen primary tuberculosis of the intestine only twice. Among the great post-mortem material of the Charité Hospital, in Berlin, ten cases of primary tuberculosis of the intestine occurred in five years. Among nine hundred and thirty-three cases of tuberculosis in children at the Emperor Frederick's Hospital for Children Baginsky never found tuberculosis of the intestine without simultaneous disease of the lungs and bronchial glands. Among three thousand one hundred and four post-mortem examinations of tubercular children Biedert observed only sixteen cases of primary tuberculosis of the intestine. He could cite from the literature of the subject many more statistics of the same kind, all indubitably showing that primary tuberculosis of the intestine, especially among children, was a comparatively rare disease, and of these few cases which had been enumerated, it was by no means certain that they were due to infection by bovine tuberculosis. . . . Though the important question whether man was susceptible to bovine tuberculosis at all was not yet absolutely decided . . . he should estimate the extent of infection by the flesh, milk, and butter of tubercular cattle as hardly greater than that of hereditary transmission,

“ Dr. J. Harvey Dew, chairman of the Committee on Ethics and Discipline of the County Medical Association, says: ‘ My own impression is that Koch's theory is not a flat denial of the possibility of conveying tuberculosis from cattle to human beings. His contention, as I understand it, was that tubercle was not transmitted by eating the meat or drinking the milk of injected cows.’

“ Dr. George B. Fowler, president of the County Medical Society, says: ‘ Koch's contention is a broad one; that bovine tuberculosis is not transmissible to human beings.’

“ Dr. E. C. Spitzka, of the County Medical Association, says: ‘ Koch's theory is somewhat vacillating, but his latest utterance, I take it, is a modification of the extreme view that tuberculosis is transmitted by the milk and meat of infected cows under all circumstances.’ ”

and he therefore did not deem it advisable to take any measures against it." \*

It will be remembered that few physicians supported Koch at the time. Of these probably the best known is Dr. Henry D. Chapin, of New York, the organizer and first chairman of the Milk Commission of the Medical Society of the County of New York, and professor of diseases of children at the New York Post-Graduate Medical School and Hospital, whose double position must have given him especial interest in this question. He wrote:

"The danger of contracting tuberculosis from cow's milk has been greatly overestimated. Tuberculosis is a dust-born disease. It is very prevalent both among human beings and animals where there is a lack of proper ventilation, and it is not so common where the ventilation is good. It is extremely probable that the variety of tubercle bacillus causing the disease in man is slightly different from that which produces it in the cow. It is interesting to know that while tuberculosis in man is decreasing in all civilized communities, tuberculosis in cattle is increasing very rapidly. The recent statement of Dr. Koch that it cannot be spread from animals to man is not accepted by most scientific observers as an infallible rule, but doubtless the cow has been unduly maligned in this connection." †

As a result of the Congress of 1901 experiments were begun in various countries to prove or disprove the truth of Koch's new doctrine and of the position which his scientific associates still held and defended. These experiments were far from being the first of their kind, and in America, at least, much literature on the subject was already within the reach of all who cared to read, most of it tending to prove or uphold the theory of transmission through beef and dairy products.‡ The

\* This extract is taken *verbatim* from the report of Koch's paper published in the *London Times*, and reprinted in the *Country Gentleman* of August 22, 1901.

† "The Problem of a Pure Milk Supply," *Forum*, May, 1902.

‡ Transactions of the New York State Agricultural Society, 1899:

"Infectiveness of Milk of Cows which have Reacted to the Tuberculin Test." Mohler; United States Department of Agriculture, 1903.

"Duration of Life of the Tubercle Bacillus in Cheese." United States Department of Agriculture, 1903.

"Relation of Bovine Tuberculosis to the Public Health." Salmon; United States Department of Agriculture, 1901.

"Legislation with Reference to Bovine Tuberculosis." Salmon; United States Department of Agriculture, 1901.

"Tuberculosis of Cattle and its Repression in Denmark." Bang; Pennsylvania Department of Agriculture, 1901.

later work, however, has naturally been watched with greater interest, and its results awaited with greater eagerness.

The *Country Gentleman* for October 17, 1901, reported:

"The Board of Health of New York City is conducting experiments in its bacteriological laboratory to test Dr. Koch's statement that human tubercle bacilli will not readily infect cows and calves. So far, experiments show Dr. Koch to be correct."

The New York *Evening Post* for December 22, 1902, published the following on the result of the French experiments:

"Dr. Borrell, chief of the laboratory of the Pasteur Institute in Paris, has reported on Dr. Garnault's four months of experiments undertaken to prove the fallacy of Professor Koch's theory that bovine tuberculosis is not communicable to human beings. Dr. Garnault's experiments appear to show that a man inoculated with a fragment of a tuberculous gland of a cow is affected with local tuberculosis limited to the point of inoculation, but Dr. Borrell confesses that it is impossible to draw a definite conclusion."

From Pennsylvania, in 1903, came the following:

"Experiments conducted by Dr. Ravenel at the University of Pennsylvania showed that a transmission of tuberculosis could be caused by subcutaneous inoculation. There is no longer any doubt, owing to these experiments and those conducted in Canada, that, while infection cannot always be transmitted, sufficient danger exists to render wise the most careful precaution in preventing the infection of human beings with bovine tuberculosis. Dr. Ravenel caused tubercle in the bowels of calves by feeding them with infected milk."

In July, 1903, the New York *Evening Post* published a dispatch from Berlin giving the following account of the German experiments and their results:

"BERLIN, July 9, 1903.—The Berlin Medical Society assembled last evening to hear Professor Kossel, of the Imperial Health Office, report the results of the prolonged experiments of the Tuberculosis Commission in infecting calves with human tuberculosis. Professor Koch's observations, prior to the celebrated London address of July, 1901, caused the Health Office to appoint the commission to make systematic experiments. Yesterday's paper was in the nature of a preliminary report.

"The commission's investigations cover three forms of introducing tubercle bacilli in calves—first, subcutaneous injection; second, in food;

"Tuberculosis of Cattle, and the Pennsylvania Plan for its Repression." Pearson and Ravenel; Pennsylvania Department of Agriculture, 1901.

"The Repression of Tuberculosis of Cattle by Sanitation." Pearson; Pennsylvania Department of Agriculture, 1901.

third, by inhalation. The preliminary report covers only the first form; but the experiments with the other forms continue.

"The commission decided to attempt the inoculation of calves, not with matter taken directly from human victims, but with cultures made therefrom. The experimentation covered thirty-nine separate cultures, twenty-three from adults and sixteen from children. The results were that nineteen calves subcutaneously treated did not show the slightest effect, nine showed after four months the slightest changes of condition, and seven showed more marked symptoms; but the propagation of tuberculosis in the body did not occur. On the other hand, four inoculations from tuberculous children infected calves with a disease which resembled a weak form of animal consumption, and two of this number died of tuberculosis. The commission summarizes as follows:

" 'The series of experiments strengthens Professor Koch's view that animal consumption as the cause of human consumption does not play the rôle generally attributed to it, but definitive judgment requires further experimentation.'

"In the discussion which followed Professor Orth, the late Professor Virchow's successor, strongly combated the view that human and animal tuberculosis are dissimilar and non-transferable."

The Cincinnati *Lancet-Clinic* for July 30, 1904, printed this editorial paragraph on the report of the British commission:

"[After Dr. Koch's address in 1901] A commission composed of men of the highest learning was appointed to look into the matter, and their recent report is a complete confirmation of the common origin of tuberculosis in mankind and in the lower animals. Notwithstanding the report of the Royal Commission, Professor Koch stands firmly to his original opinion."

Dr. Koch was absent from Berlin when the report of the British commission was published, but as soon as he returned he restated his position in clear and unmistakable terms. He says:

"The report of the Royal Commission does not contain a single fact to make me change my opinion, which is based on very careful experiments, not only made by myself and my assistants, but also by other medical men of the highest standing. It is for my opponents to prove that I am wrong. I have tried for years to find a case in which tuberculosis was transferred from animals to man. Three years ago the Prussian Minister of Public Instruction, at my request, instructed all physicians in charge of the large public hospitals to report all cases which came to their notice of bovine tuberculosis having been transmitted to man, and up to this day we have been waiting to hear of the first case. As long as the Royal Commission does not show me a case in which such infection is proved I cannot believe in their assertions. Veterinary surgeons say that one-half per cent. of all cows have bovine tuberculosis, yet the Royal Commission cannot state a case of a man having been infected by drink-

ing the milk of such cows. I lay such great stress upon this fundamental question because I should like to prevent the further enormous waste of money caused by the false view of the possibility of bovine tuberculosis being transmitted to man. How many millions are wasted by the killing of animals, the flesh of which is said to be dangerous, and for the sterilization and pasteurization of milk, apart from the fact that the milk loses many of its good qualities by that process? If all of these millions were saved and spent on really practical means for combating tuberculosis we might have a chance of getting the mastery over it." \*

As Dr. Koch says, this question is not only of scientific interest, but of great practical and industrial importance. If present legislation concerning tuberculous cattle were removed, it would mean the sparing of thousands of animals which are now destroyed, and the use of their products. If these products were declared safe to use, it would mean a greatly increased meat and milk supply at less cost than now, when the stock-raiser has to make his remaining animals pay for those which have been sacrificed. More directly, it is of moment to every nurse who works with the artificial feeding of babies and young children. It has been proven by government experiments and by private experience that the various germ-killing processes make milk less digestible and less nutritious to the system.† There is yearly a stronger feeling against any unnecessary heating of milk for infant feeding. Should it ever be abolished, there would be a decrease in our daily work for every bottle-fed baby; but whether with a final good or evil result to the child, the future has yet to show us. This is one aspect, but only one of many, which makes this tuberculosis question of strongest interest to all intelligent people.

\* Published in the *Daily News*, June 24, 1904, and the *Lancet-Clinic*, July 30, 1904.

† "The Comparative Digestibility of Raw, Pasteurized, and Cooked Milk;" Maryland Experiment Station, 1901. "Facts About Milk;" United States Department of Agriculture, 1896. "The Feeding of Infants;" Dr. Joseph Winters, 1901, and others.

